

SOIL INVERTEBRATES: MAJOR REFERENCE TEXTS

Compiled by:

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This bibliography is incomplete but should serve as an introduction to the literature on the various groups of soil invertebrates. (Research papers are almost all omitted. Works in languages other than English (some of which fill important gaps) are almost all omitted; references to most of them will be found in the books listed.

GENERAL

D'Aguilar, J., C. Athias Henriot, A. Bessard, M.-B. Bouché and M. Pussard. (Editors). 1971.

Organismes du sol et production primaire. IV Colloquium Pédobiologiae. Institut National de la Recherche Agronomique, Paris. 590 pp.

Important research papers on the soil ecosystem, including one on benefits of seeding a wormless soil with earthworms. (35 Engl., 11 Ger., 9 Fr.). Refs. after each paper.

Anderson, J.M. and A. MacFadyen. (Editors). 1976. The Role of Terrestrial and Aquatic Organisms in Decomposition Processes. Blackwell, Oxford, England. 474 pp.

Proceedings of British Ecological Society Symposium. Covers physico-chemical aspects of the environment, interrelationships of organisms involved and their role in soil and fresh water ecosystems and modelling of decomposer systems. Refs. after each paper.

Bornebusch, C.H. 1930. The Fauna of Forest Soil. Nielsen & Lydiche, Copenhagen. (*From Forst. Forsogsv. i Danmark, II: English and Danish*). 224 pp.

A classic.

Brauns, S. 1968. *Praktische Bodenbiologie*. Gustav Fisher Verlag, Stuttgart. xviii + 470 pp.

Classic text on Soil Biology with a practical emphasis. Not as yet translated into English. Refs. after each chapter.

Burges, A. and F. Raw. (Editors). 1967. *Soil Biology*. Academic Press, New York. 532 pp.

An anthology of technical papers discussing biology of different classes of soil life.

Cloudsley-Thompson, J.L. 1958. *Spiders, Scorpions, Centipedes and Mites*. Pergamon Press, Oxford. 278 pp.

(Paperback edition 1968). Includes most groups other than hexapods besides those in title.

Illustrates their diversity and versatility. Refs. after each chapter.

Cloudsley-Thompson, J.L. 1967. *Microecology*. (Institute of Biology's Studies in Biology, 6). Edward Arnold Ltd., London. 48 pp.

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- Simple introduction to predominantly soil and related fauna. 23 refs.
- Cloudsley-Thompson, J.L. & J. Sankey. 1961. *Land Invertebrates*. Methuen, London. 156 pp.
Introductory, relates to various groups of soil animals.
- Coineau, Y. 1974. *Introduction a l'étude des Microarthropodes du sol et de ses annexes*. Documents pour l'enseignement pratique de l'écologie. Doin, Paris, 188 pp.
Excellent textbook, with chapters on abiotic and biotic factors in the soil, techniques, taxonomy and biology and a comparison of the microfauna of different soil types.
- Danks, H.V. 1979. *Canada and its insect fauna*. Mem. Ent. Soc. Can. 108: 573 pp.
Synopsis of information available on insects and related arthropods in Canada.
- Dickinson, C.H. and G.J.F. Pugh. (Editors). 1974. *Biology of Plant Litter Decomposition*. Vol. 1 & 2. Academic Press, New York. 241 & 775 pp.
The most comprehensive work on the subject. Refs. after each chapter.
- Dindal, D.L. (Editor). 1980. *Soil Biology as Related to Land Use Practices*. Proc. VII Int. Soil Zoology Colloquium. Office of Pesticide and Toxic Substances, EPA, Washington, DC. 880 pp.
Current research on the effects of human ameliorations and perturbations on soil organisms.
- Doeksen, J. and J. van der Drift. (Editors). 1963. *Soil Organisms*. North Holland Publ. Co., Amsterdam. 453 pp.
Research on the biology and ecology of soil organisms. Refs. after each chapter.
- Drift, J. van der. 1951. *Analysis of the Animal Community in a Beech Forest Floor*. Institut v. Toegepast Biologisch Onderzoek in de Natuur, Mariedaal, Oosterbeek, Netherlands. [From *Tijdschr. v. Ent.* 94 (1)]. 168 pp.
Oligochaetes and molluscs receive brief notice.
- Graff, O. and J.E. Satchell. 1967. *Progress in Soil Biology*. North Holland Publ. Co., Amsterdam. 656 pp.
Anthology of technical and specialized papers from German colloquium. Half of papers are in German. Refs. after each presentation.
- Haarlov, N. 1960. *Microarthropods from Danish Soils: Ecology, Phenology*. Andelsbogtrykkeriet, Odense, Denmark. (From *Oikos, Suppl.* 3). 176 pp.
- Jackson, R.M. and F. Raw. 1966. *Life in the Soil*. Edward Arnold Ltd., London. 60 pp.
Authors from Rothamsted discuss soil ecology and ways of studying it. 21 refs.
- Kaestner, A. 1967. *Invertebrate Zoology*. Vol. I. John Wiley and Sons Inc. 597 pp.
(Translation of earlier German work).
Includes information on biology, ecology and general classification of platyhelminths, rotifers, nematodes, molluscs and annelids.
- Kaestner, A. 1968. *Invertebrate Zoology*. Vol. II. John Wiley and Sons Inc. 472 pp.
(Translation of earlier German work).
Includes information on biology, ecology and general classification of tardigrades, arachnids, centipedes, millipedes, pauropods and symphylans.
- Kaestner, A. 1970. *Invertebrate Zoology*. Vol. III. John Wiley and Sons Inc. 597 pp.
(Translation of earlier German work).
Includes information on biology, ecology and general classification of isopods and amphipods.
- Kevan, D.K.McE. (Editor). 1955. *Soil Zoology*. Butterworths Scientific Publications, London & Academic Press, New York. 512 pp.
First integrated study of soil fauna on an international footing. It is still a basic reference

work. Refs. after each paper.

Kevan, D.K.McE. (Editor). 1968. *Soil Animals*. H., F. & G. Witherby, London, & Philosophical Library Inc., New York. 244 pp.

Corrected and slightly augmented reprinting of 1962 edition which covers all groups of soil animals.

Kuhnelt, W. 1976. *Soil Biology: with special reference to the Animal Kingdom*. 3rd ed. Faber & Faber, London. 397 pp.

Draws mostly on work from European soils, but is still very good for general description of soils and the animals in them. 1700 refs.

Lawrence, R.F. 1953. *The Biology of the Cryptic Fauna of Forests*. A. A. Belkema, Cape Town. 408 pp.

Emphasis on fauna of indigenous forests of South Africa. 13 pp. of refs.

Lebrun, Ph., H.M. André, A. de Medts, C. Gregoire-Wibo and G. Wauthy. (Editors). 1983. *New Trends in Soil Biology, Proc. VIII. Intl. Colloquium of Soil Zoology*, Louvain-la-Neuve, Belgium. 1982. 700 pp.

Most recent text on research in soil biology. Topics are covered in four major areas: the role played by soil fauna in mineral cycling; functional relationships between soil organisms; ecophysiology of soil animals and restoration capacity of soil communities.

MacFadyen, A. 1963. *Animal Ecology: Aims and Methods*. 2nd ed. Sir Isaac Pitman & Sons, London. 344 pp.

A good ecology text that emphasises the soil ecosystem. Approx. 1000 refs.

Murphy, P.W. (Editor). 1962. *Progress in Soil Zoology*. Butterworths, London. 398 pp.

Technical papers about methods of extracting soil animals. Refs. after each presentation.

Pesson, P. (Editor). 1971. *Le vie dans les sols. Aspects Nouveaux. Etudies experimentales*. Gautier-Villars, Paris. x + 472 pp.

Comprehensive review of ecology of soil organisms with emphasis on current research. Refs. after each chapter.

Phillipson, J. (Editor). 1971. *Methods of study in quantitative soil ecology: Population, production and energy flow*. I.B.P. Handbook No. 18. 297 pp. Blackwell, Oxford.

Good overview of current techniques. Refs. after each presentation.

Pimental, R.A. 1967. *Invertebrate Identification Manual*. Van Nostrand Reinhold Co., New York. 151 pp.

Excellent illustrations of the major orders and families.

Richards, B.N. 1974. *Introduction to the Soil Ecosystem*. Longman Inc., New York. 266 pp.

A good modern approach to the subject, from Australia. Refs. after each chapter.

Savory, T. 1971. *Biology of the Cryptozoa*. Merrow Publishing Co., Watford, England. 56 pp.

Introductory textbook.

Schaller, F. 1968. *Soil Animals*. Univ. Mich. Press, Ann Arbor. 145 pp.

Introduction to soil ecosystems, emphasizing larger soil animals. No references.

Sheals, J.G. (Editor). 1969. *The Soil Ecosystem*. Systematics Assoc., London. 247 pp.

Proceedings of conference emphasising problems of classification of soils and their components. Includes review on impacts of agricultural practices. Refs. after each presentation.

U.N.E.S.C.O. 1969. *Soil Biology: Review of Research*. U.N.E.S.C.O., Paris. 244 pp.

Summarizes knowledge of soil biological processes. Refs. after each chapter.

Vaněk, J. (Editor). 1975. *Progress in Soil Zoology. Proceedings of the 5th International*

Colloquium on Soil Zoology held in Prague, September 17–22, 1973. Academia Publishing House, Prague. 630 pp.

Most recent text on research in soil zoology as of 1975. Section on influence of human activities on soil organisms. Refs. after each presentation.

Wallwork, J.A. 1970. *Ecology of Soil Animals*. McGraw-Hill, New York. 283 pp.

Basic text updating some of the material in Kevan (1962). Refs. after each chapter.

Wallwork, J.A. 1976. *The Distribution and Diversity of Soil Fauna*. Academic Press, London. 355 pp.

A continuation of his *Ecology of Soil Animals* (1970). Refs. after each chapter.

Webb, J.E., J.A. Wallwork and J.H. Elgood. 1978. *Guide to Invertebrate Animals*. 2nd ed. Macmillan Press Ltd., London. 305 pp.

Guide for undergraduates with up-to-date classification scheme. Limited illustrations.

PROTOZOA

MacKinnon, D.L. and R.S.T. Hawes. 1961. *An Introduction to the Study of Protozoa*. University Press, Oxford.

Good section about methods.

Stout, J.D. and O.W. Heal. 1967. Protozoa. pp. 149–195. *In* Burges, N.A. and F. Raw. (Editors). *Soil Biology*. Academic Press, New York.

Excellent reference text on soil protozoa.

PLATYHELMINTHES

Schmidt, G.D. 1982. Platyhelminthes. pp. 727–823. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms*. Vol. 1. McGraw-Hill Book Co.

Primarily parasitic, some platyhelminthes are free-living in highly organic moist soils.

GASTROTRICHA

Hummon, W.D. 1982. Gastrotricha. pp. 857–863. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms*. Vol. 1. McGraw-Hill Book Co.

ROTIFERA

Donner, J. 1966. *Rotifers*. Frederick Warne & Co., Ltd., London. 80 pp.

Simple, yet thorough introduction to “wheel animals”. Mainly aquatic. 29 refs.

Nogrady, T. 1982. Rotifera. pp. 865–872. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms*. Vol. 1. McGraw-Hill Book Co.

Up-to-date classification of this group.

NEMATOMORPHA

Maggenti, A.R. 1981. *General Nematology*. Springer Verlag, New York. 372 pp.

Contains a short (pp. 27–32) section on Nematomorpha or gordian worms.

NEMATODA (= NEMATATA)

Bird, A.F. 1971. *The Structure of Nematodes*. Academic Press, New York. 318 pp.

General textbook on the morphology and physiology of nematodes.

Chitwood, B.G. and M.B. Chitwood. (Editors). 1950. *Introduction to Nematology*. University Park Press, London. 334 pp.

Papers on morphology, physiology and life histories.

Croll, N.A. 1970. *The Behaviour of Nematodes, their activity, senses and responses*. Edward Arnold Ltd., London. 117 pp.

Croll, N.A. and B.E. Matthews. 1977. *Biology of Nematodes*. John Wiley and Sons, New York, Toronto. 201 pp.

Introductory textbook presenting a unified view of the whole range of nematode types.

- Goodey, J.B. 1963. *Laboratory Methods for Work with Plant and Soil Nematodes*. 3rd ed. Ministry of Agriculture, Fisheries & Food (Tech. Bull. 2), London. 47 pp.
- Maggenti, A.R. 1981. *General Nematology*. Springer Verlag, New York. 372 pp.
Excellent general textbook on nematode morphology, physiology and classification. Third of book deals with parasitic types, no special section on free-living soil nematodes.
- Maggenti, A.R. 1981. Nematoda. pp. 879–929. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms*. Vol. 1. McGraw-Hill Book Co.
Up-to-date classification of group.
- Nicholas, W.L. 1975. *The Biology of Free-Living Nematodes*. Clarendon Press, Oxford. 219 pp.
“This is a book written by an enthusiast for the unconvinced” and covers the morphology, physiology, biochemistry, ecology, culturing, techniques and introductory taxonomy of these invertebrates.
- Poinar, G.O., Jr. 1983. *The Natural History of Nematodes*. Prentice-Hall Inc., New Jersey. 323 pp.
Introductory textbook to biology and ecology of nematodes. Includes section on classification.
- Sasser, J.N. and W.R. Jenkins. (Editors). 1960. *Nematology: Fundamentals and recent advances with emphasis on plant parasitic and soil forms*. University of North Carolina Press, Chapel Hill, N.C. 480 pp.
Contains an excellent section on methodology.
- Southey, J.F. (Editor). 1959. *Plant Nematology*. Ministry of Agriculture, Fisheries & Food (Tech. Bull. 7), London. 175 pp.
Lecture course, which reviews the subject and emphasizes problems in British agriculture. Refs. after each chapter.
- Southey, J.F. (Editor). 1970. *Laboratory Methods for Work with Plant and Soil Nematodes*. Ministry of Agriculture, Fisheries & Food (Tech. Bull. 2), London. 148 pp.
A great “how-to” book on methods of studying nematodes.
- Thorne, G. 1961. *Principles of Nematology*. McGraw-Hill Book Co., New York, Toronto, London. 553 pp. 31 pp. refs.
- ANNELIDA (OLIGOCHAETA)*
- Anonymous. 1982. *Earthworms: Raising, uses, beneficial aspects 1978–1981*, 97 citations. Produced from AGRICOLA database. Available free from U.S.D.A. Library, Beltsville, MD.
- Appelhof, M. (Editor). 1981. *Workshop on the Role of Earthworms in the Stabilization of Organic Residues*. Vol. 1. Kalamazoo, Michigan, April 9–12, 1980. Beech Leaf Press, Kalamazoo, Michigan. 315 pp.
Has no bearing on identification but, besides being interesting, this book has an extensive list of research needs in Appendix.
- Bal, L. 1982. *Zoological Ripening of Soils*. Centre for Agricultural Research and Documentation, Wageningen, Netherlands. Agricultural Research Reports 850.
A monograph on the contribution of soil animals to soil structure, in which earthworms have an important role. The stilted text is redeemed by a number of excellent photographs, a glossary and a large bibliography.
- Bouché, M.B. 1972. *Lombriciens de France: Ecologie et systématique*. *Ann. Zool. Ecol. Anim.* 72(2): 214–472.

Darwin, C. 1897. The formation of vegetable mould, through the action of worms with observations on their habits. John Murray, London. vii + 328 pp.

As relevant today as in 1897. There have been several reprintings. Darwin was one of the first to realise (and put his thoughts and painstaking observations into print) how earthworms affect the landscape. His estimates of earthworm (*L. terrestris*) density are probably low. Refs. throughout text.

Edwards, C.A. and J.R. Lofty. 1972. Biology of Earthworms. Chapman & Hall, London. 283 pp.

Comprehensive review of all aspects of earthworm biology and ecology. 32 pp. of refs. 2nd edition in 1977 with a more complete bibliography.

Gates, G.E. 1972. Burmese Earthworms. An introduction to the systematics of megadrile oligochaetes with special references to Southeast Asia. Trans. Amer. Philos. Soc. 62(7): 1-326.

Lee, K.E. 1959. The Earthworm Fauna of New Zealand.. N.Z. Dept. Scientific & Industrial Research, Auckland. 486 pp.

Has general application.

Nielsen, C.O. and B. Christensen. 1959, 1961, 1963. The Enchytraeidae: Critical Revision and Taxonomy of European Species. *Natura Jutlandica*. Vols. 8, 9, 10.

Essential for workers on Enchytraeidae.

Reynolds, J.W. 1977. The Earthworms (Lumbricidae and Sparganophilidae) of Ontario. Royal Ontario Museum, Life Sciences, Misc. Publications. 141 pp.

A comprehensive review of the Ontario earthworm fauna. Very well illustrated by Dan Dindal. Indispensable for Ontario workers. Good bibliography with the bonus that Reynolds cites his and Gates' papers in the Bull. Tall Timbers Res. Stn. and Megadrilologica up to 1977. Reynolds has published extensively on the earthworm fauna of several American states (particularly in the Northeast) and several Canadian provinces (Ontario, Quebec, Nova Scotia, New Brunswick, and P.E.I.). This book also briefly summarizes Reynolds' considerable experience in sampling methods and preservation of earthworm specimens.

Satchell, J.E. (Editor). 1983. Earthworm Ecology. Chapman & Hall Ltd., London. 495 pp.

Papers cover topics under the general headings of: earthworms and organic matter; earthworm ecology in grassland soils, in cultivated soils, in forest soils, in tropical and arid soils; earthworms and land reclamation, and soil pollution; utilization of wastes by earthworm culture; earthworms and microflora; earthworms in food chains; earthworm evolution and distribution patterns; taxonomy and nomenclature. Refs. after each chapter.

Sims, R.W. In press. A Classification and the Distribution of Earthworms, Suborder Lumbricina (Haplotaxida: Oligochaeta). Bull. Brit. Mus. Nat. Hist. (Zool.).

Worden, D.D. (Editor). 1981. Workshop on the Role of Earthworms in the Stabilization of Organic Residues. Vol. II. Bibliography. Beech Leaf Press, Kalamazoo, Michigan.

3036 citations, cumulative author and subject indices. Nematodes and microorganisms that impact on earthworms are also cited.

Zajonc, I. and J. Cepelak. 1968. Colloquium – Questions on Ecology and Taxonomy of Earthworms. 149 pp. Institute of Zoology – Institute for Biology and Ecology of Cultural Plants, Agricultural University, Nitra, Czechoslovakia. 149 pp.

Papers in English, French, German, Russian. Refs. after each presentation.

MOLLUSCA

Cameron, R.A.D. and M. Redfern. 1976. British Land Snails. Synopses of the British Fauna

(New Series) No. 6. Publ. for Linnean Soc. of London by Academic Press, London. 64 pp.
Keys and notes to the identification of species. Contains sections on morphology, collecting and preservation.

Leonard, A.B. 1959. Handbook of Gastropods of Kansas. University of Kansas Natural History Museum, Topeka, Kansas.

Only partially applicable to Canada.

Runham, N.W. and P.J. Hunter. 1970. Terrestrial Slugs. Hutchinson University Library, London. 185 pp.

Review of biology, ecology and economic importance of slugs. 21 pp. of refs.

CRUSTACEA

Bousfield, E.L. 1982. Amphipoda. pp. 254–293. *In* Parker, S.P. (Editor). Synopsis and classification of living organisms. Vol. 2. McGraw-Hill Book Co.

Crustaceans common in tropical soils.

Richardson, H. 1905. A Monograph on the Isopods of North America. Bull. U.S.N.M. 54: Reprinted by Antiquariaat Junk, Netherlands 1972.

A classic, and still useful.

Schultz, G.A. 1982. Isopoda. pp. 249–254. *In* Parker, S.P. (Editor). Synopsis and classification of living organisms. Vol. 2. McGraw-Hill Book Co.

Up-to-date classification of Woodlice.

Sutton, S.L. 1972, 1980. Woodlice. Ginn & Co., Ltd., London. 144 pp.

An introduction to the biology, ethology, genetics, ecology, and identification of woodlice. Includes a section on techniques.

Walker, E.M. 1927. The Woodlice or Oniscoidea of Canada (Crustacea, Isopoda). *Can. Field-Nat.* 41: 173–179.

Van Name, W.G. 1936. The American Land and Freshwater Isopod Crustacea. *Bull. Am. Mus. Nat. Hist.* 71: 1–535.

Useful for identifying Canadian species.

TARDIGRADA

Morgan, C.I. 1982. Tardigrada. pp. 731–739. *In* Parker, S.P. (Editor). Synopsis and classification of living organisms. McGraw-Hill Book Co.

Up-to-date classification of group.

MYRIAPODA

Blower, J.G. 1958. British Millipedes (Diplopoda). *Linnean Soc. Synopses of the British Fauna*, 11: 74 pp.

Mainly taxonomic; useful in E. Canada where most species are European introductions.

Blower, J.G. (Editor). 1974. Myriapoda. *Symposia of the Zoological Society of London*, 32. Academic Press, London & New York. 712 pp.

General work, including some taxonomy.

Broleman, H.W. 1932. Chilopodes. *Faune France* 25. 405 pp.

Useful for the numerous introduced species.

Demange, J.-M. 1981. Les Mille-Pattes, Myriapodes. Société Nouvelle des Editions Boubée, Paris. 284 pp.

Morphology, ecology and ethology of class with key to determination to species of myriapods in France. Excellent figures plus 4 plates in colour and 9 colour photographs.

Eason, E.H. 1964. Centipedes of the British Isles. Frederick Warne & Co., Ltd., London. 294 pp.

- Has general application; useful in E. Canada where most species are the same or similar.
- Edwards, C.A. 1952. A Revision of the British Symphyla. *Proc. Zool. Soc. London.* 132: 403–439.
- Edwards, C.A. 1952. Keys to the Genera of the Symphyla. *J. Linn. Soc. Zool.* 44: 164–169.
Most useful text on Symphyla.
- Hoffman, R.L. 1979. Classification of the Diplopoda. *Muséum d'Histoire Naturelle, Genève.* 237 pp.
- Hoffman, R.L. 1982. Chilopoda. pp. 681–688 *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms. Vol. 2.* McGraw-Hill Book Co.
Most recent classification of centipedes.
- Hoffman, R.L. 1982. Diplopoda. pp. 689–724. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms. Vol. 2.* McGraw-Hill Book Co.
Most recent classification of millipedes.
- Kevan, D.K.McE. 1983a. A Preliminary Survey of Known and Potentially Canadian and Alaskan Centipedes (Chilopoda). *Can. J. Zool.* 61: 2938–2955.
Present state of knowledge of centipedes, in Canada and Alaska, including economic and biological aspects. Excellent reference section.
- Kevan, D.K.McE. 1983b. A Preliminary Survey of Known and Potentially Canadian and Alaskan Millipedes (Diplopoda). *Can. J. Zool.* 61: 2956–2975.
Diplopod fauna of Canada, including a checklist of species known to, and likely to occur, in Canada. Excellent reference section.
- Lewis, J.G.E. 1981. *The Biology of Centipedes.* Oxford University Press. 476 pp.
Most recent textbook on this subject.
- Remy, P.A. 1958. *Paupodes des Etats-Unis d'Amerique et de la Jamaïque.* *Mém. Soc. Natn. Sci. nat. math. Cherbourg* 48. 77 pp.
Probably will be useful for some Canadian species.
- Scheller, U. 1982. Paupoda. pp. 724–726. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms. Vol. 2.* McGraw-Hill Book Co.
Up-to-date classification of paupods.
- Scheller, U. 1984. Paupoda (Myriapoda) from Canada. *Can. J. Zool.* In press.
- COLLEMBOLA**
- Christiansen, K. and P. Bellinger. 1980–1981. *The Collembola of North America North of Rio Grande.* Part 1 (1980) Poduridae and Hypogastruridae. Part 2 (1980) Onychiuridae and Isotomidae. Part 3 (1980) Entomobryidae. Part 4 (1981) Neelidae and Sminthuridae. 1322 pp. Grinnell College, Grinnell.
The current standard work on North American Collembola. Illustrations are numerous, but finer details are obscured by bad printing. Part 1 contains a good general description of Collembola morphology and describes several slide preparation techniques. Part 4 contains a useful morphological glossary and an exhaustive author index.
- DeHarveng, L. 1982. Clé de détermination des genres de Neanurinae (Collemboles) d'Europe et de la région Méditerranéenne avec description de deux nouveaux genres. *Trav. Lab. Ecobiol. Arthr. Edaph.*, Toulouse 3(4): 7–13.
Identification keys to the many new Neanurinae genera described from Europe since Gisin (1960).
- Ellis, W.N. & P.F. Bellinger. 1973. An annotated list of generic names of Collembola (Insecta) and their type species. *Mon. Ned. Ent. Ver.* 7: 1–74.

A necessary publication for taxonomists in particular.

Fjellberg, A. 1980. Identification keys to Norwegian Collembola. Norsk Entomologisk Forening, As. 152 pp.

Fairly up to date, illustrated keys covering most of the Nordic species.

Fjellberg, A. 1984. Arctic Collembola 1. Alaskan Collembola of the families Poduridae, Hypogastruridae, Odontellidae, Brachystomellidae and Neanuridae. Ent. Scand. Suppl. (In press).

Gisin, H. 1960. Collembolenfauna Europas. Museum d'Histoire Naturelle, Genève. 312 pp.

Well illustrated identification keys and short description of species. Contains a general introduction to collembole morphology and identification technique. Although largely out of date, the book is still the standard work among European collembologists.

Massoud, A. 1967. Monographies des Neanuridae, Collemboles Poduromorphes a pièces buccales modifiées. Biol. Amer. Austr. CNRS 3: 1–399.

A standard work on the family Neanuridae, but now largely out of date, at least concerning the European fauna.

Maynard, E.M. 1951. A Monograph of the Collembola or Springtail Insects of New York State. Comstock Publishing Co. Inc., Ithaca, NY. 339 pp. + 29 pl.

A few biological notes included; nomenclature not up to date.

Rusek, J. 1977. Protura, Collembola, Diplura, Thysanura. Enumeration Insectorum Bohemoslovakiae. Acta Faun. Ent. Mus. Nat. Pragae 15(4): 9–21.

A check list to the apterygotan species recorded from Czechoslovakia.

Salmon, J.T. 1964. An Index to the Collembola. Bull. Roy. Soc. New Zealand 7(1–2). 644 pp. Wellington.

An index to world literature on Collembola up to 1962 arranged (1) by author and (2) by species. Contains also a key to world genera. A very useful book despite numerous minor errors.

Yosii, R. 1977. Critical check list of the Japanese species of Collembola. Contr. Biol. Lab. Kyoto University 25(2): 141–170.

In addition to the species list, the paper also provides identification keys to the Japanese genera.

INSECTS (OTHER THAN COLLEMBOLA)

Arnett, R.H. Jr., N.M. Downie and H.E. Jaques. 1980. How to Know the Beetles. Brown Publishing Co., Dubuque. 416 pp.

Chandler, L. 1957. The orders Protura and Diplura in Indiana. Proc. Indiana Acad. Sci. 66: 112–114.

Of very limited use.

Chu, H.F. 1949. How to know the immature insects. Brown Publishing Co., Dubuque. 234 pp.

Lee, K.G. & T.G. Wood. 1971. Termites and Soils. Academic Press, London and New York.

Morgan, C.I. and P.E. King. 1976. British Tardigrades, Tardigrada: Keys and notes for the identification of the species. Synopsis of the British Fauna No. 9. Academic Press, London. 133 pp.

Important reference source.

Nosek, J. 1973. The European Protura. Museum d'Histoire Naturelle, Genève. 345 pp.

The most up-to-date work on taxonomy, ecology and distribution. Includes keys for identification.

Ramazzotti, G. 1972. Il Phylum Tardigrada. Mem. Ist Ital. Idrobiol. 28: 1–732.

An introduction to the world literature on the group.

Smith, L.M. 1960. The family Projapygidae and Anahapygidae (Diplura) in North America. *Ann. Ent. Soc. Am.* 53: 575–583.

Sudd, J.M. 1967. An introduction to the behaviour of ants. Edward Arnold Ltd., London.
A useful introduction to ants.

Tuxen, S.L. 1964. The Protura. A revision of the species of the world with keys for determination. Hermann, Paris. 360 pp.

A major work on Protura.

ARACHNIDA (EXCEPT ACARI)

Comstock, J.H. 1940. The Spider Book. Cornell University Press, Ithaca, NY. 727 pp.

A classic spider work, though outdated taxonomically.

Gertsch, W.J. 1978. American Spiders. 2nd ed., Van Nostrand-Reinhold, New York. (1st ed. 1949).

A readable summary for general readers.

Hoff, C.C. 1949. The Pseudoscorpions of Illinois. *Illinois Nat. Hist. Surv. Bull.* 24: 412–498.

A somewhat dated, but still very useful, introduction to morphology and key.

Hoff, C.C. 1958. List of the Pseudoscorpions of North America North of Mexico. *Amer. Mus. Nov. No.* 1875: 1–50.

With a key to genera.

Hoff, C.C. 1959. The Ecology and Distribution of the Pseudoscorpions of North-Central New Mexico. University of New Mexico Publications in Biology, No. 8. 68 pp.

Contains much general information on biology.

Kaston, B.J. 1948. Spiders of Connecticut. *Bull. Conn. Geol. Nat. Hist. Surv.* 70: 1–874.

A classic study, very useful for northeastern U.S. and southeastern Canada. Supplement published in 1977 (*Jour. Arachnol.* 4: 1–72) updates nomenclature and selected keys.

Kaston, B.J. 1972. How to Know the Spiders. 3rd ed., W. Brown, Dubuque. 272 pp.

Collection techniques, picture keys to orders and families and keys to most common genera; a good place to start.

Levi, H.W., L.R. Levi and H.S. Zim. 1968. A Guide to Spiders and Their Kin. Golden Press, New York. 160 pp.

A non-technical, "look-see" guide.

Muchmore, W.B. 1982. Pseudoscorpionida. pp. 96–102. *In* Parker, S.P. (Editor). Synopsis and classification of living organisms. Vol. 2. McGraw-Hill Book Co.

Nelson, S. Jr. 1975. A Systematic Study of Michigan Pseudoscorpionida (Arachnida). *Amer. Midl. Nat.* 93: 257–301.

Savory, T. 1977. Arachnida. 2nd ed. Academic Press, London, New York. 340 pp.

General introduction to the morphology, physiology, ecology, and taxonomy of the class.

Weygoldt, P. 1969. The Biology of Pseudoscorpions. Harvard University Press, Cambridge, MA. 145 pp.

Translation from German of 1966. Covers anatomy, physiology, ecology, taxonomy and techniques. An excellent, readable summary.

ACARI

Baker, E.W. and G.W. Wharton. 1952. An Introduction to Acarology. The Macmillan Co., New York. 465 pp.

Largely but not exclusively taxonomic.

Balogh, J. 1972. The Oribatid Genera of the World. Akad. Kiado, Budapest. 188 pp. + 71 pls.

- Balogh, J. and S. Mahunka. 1983. *The Soil Mites of the World. 1. Primitive Oribatids of the Palaearctic Region.* Elsevier, Amsterdam. 372 pp.
Keys to Palaearctic species.
- Evans, G.O., J.G. Sheals, & D. MacFarlane. 1961. *The Terrestrial Acari of the British Isles: An Introduction to their Morphology, Biology and Classification.* British Museum, London. 219 pp.
- Evans, G.O. and W.M. Till. 1979. Mesostigmatic Mites of Britain and Ireland (Chelicerata: Acari-Parasitiformes). *Trans. Zool. Soc. Lond.* 35: 139–270.
An introduction to their external morphology and classification.
- Gilyarov, M.S. (Editor). 1975. *A Key to the Soil-inhabiting Mites, Sarcoptiformes.* (In Russian). Nauka, Moscow. 491 pp.
Translation (on fiche) available from Canadian Index of Scientific Translations, Canada Institute for Scientific and Technical Information, National Research Council of Canada, Ottawa K1A 0S2. (Translation #4328).
- Gilyarov, M.S. 1978. *A Key to the Soil-inhabiting Mites, Trombidiformes.* (In Russian). Nauka, Moscow.
Relevant to North American fauna. Translation available as per Gilyarov (1975). (Translation #4569).
- Gilyarov, M.S. and N.G. Bregetova. (Editors). 1977. *A Key to the Soil-inhabiting Mites, Mesostigmata.* (In Russian). Nauka, Leningrad. 718 pp.
Very relevant to North American fauna. Translation available as per Gilyarov (1975). (Translation #4371).
- Hughes, T.E. 1959. *Mites, or the Acari.* University of London Athlone Press, London. 225 pp.
- Kethley, J. 1982. Acariformes – Prostigmata. pp. 117–145. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms. Vol. 2.* McGraw-Hill Book Co.
- Krantz, S.W. 1978. *A Manual of Acarology.* Oregon State University, Corvallis, OR. 509 pp. 2nd ed.
Largely, but not exclusively, taxonomic. The most widely used introductory text on acarology.
- O'Connor, B.M. 1982. Astigmata. pp. 146–169. *In* Parker, S.P. (Editor). *Synopsis and classification of living organisms. Vol. 2.* McGraw-Hill Book Co.
- NOTE: A manual dealing with soil organisms in North America is presently being edited by D.L. Dindal (to be published by J. Wiley & Sons).

STATISTICS, EXPERIMENTAL DESIGN & SAMPLING TECHNIQUES FOR SOIL ZOOLOGY

Unlike the epigeaic fauna, there are few “models” which have been explicitly established for soil animal populations. Many epigeaic models have been adapted for soil animal models with varying degrees of success. The euedaphic fauna is rarely homogeneous even throughout the small volumes of sampling cores; the fauna varies dramatically with depth and is highly dependent upon climate factors, soil type, vegetation cover and, structures as roots or earthworm tunnels, for example. Soil animals often exhibit aggregative behaviour, which, presumably, is their response to exploitation of food resources (which again are often aggregated and not evenly or even randomly dispersed in a plot) or reproductive requirements. There are a large number of statistical texts available for consultation for the more difficult

statistical analyses, and the wide availability of computers often makes it tempting to get heavily (perhaps even unnecessarily) involved in this end of the work. An appraisal of statistical texts is not provided, but listed are a few texts and papers which have an ecological bent, and that are useful in accessing and comprehending this literature. The assistance of a *sympathetic* biometrician for assistance in field experiments should not be underrated.

Marked-capture-recapture techniques, which should have some utility for estimating the abundance of soil animal populations, have not been widely used in the past for this purpose, but these techniques might be particularly applicable to earthworms, for example. Some of the listings given provide numbers and analyses of soil faunal data on which to hang your hat or against which you may compare your own data.

Gauch, H.G., Jr. *ca.* 1976–present. The Cornell Ecology Programs Series. Available from Cornell University, Dept. of Ecology & Systematics, 224 Langmuir Laboratory, Ithaca, NY 14850.

A series of main-frame computer programs (with considerable documentation) for analysing ecological data. The catalog has been revised and up-dated several times. Program & documentation are available at nominal cost. Several Canadian universities and government institutions now provide and support these programs. The programs deal mainly with ordination and classification of data (particularly useful for large sets of data).

Jeffers, J.N.R. Statistical Checklists. Nos. 1, 2, & 3 (Design of Experiments, Sampling & Modelling, respectively). Institute of Terrestrial Ecology, Cambridge, UK.

Lists of questions to ask of yourself and your experiments. Thought-provoking and helpful.

Jeffers, J.N.R. 1978. An Introduction to Systems Analysis with Ecological Applications. University Park Press, Baltimore.

For those of you into ecological modelling - this is a very readable account with lots of worked examples.

Lewis, T. and L.R. Taylor. 1967. Introduction to Experimental Ecology. Academic Press.

A relatively basic approach to quantitative ecology, but a treasury of techniques, graphs, lists and analytical methodology for ecologists.

Macfadyen, A. 1963. Animal Ecology. 2nd Ed. Pitman & Sons.

Less mathematical approach than Southwood or Taylor & Lewis, but Macfadyen's credentials as a soil zoologist mean that there are plenty of illustrative examples from soil ecology.

Petersen, H. (Editor). 1982. Quantitative ecology of microfungi and animals in soil and litter. *Oikos* 39: 388–422.

Extensive tabulations and comparisons of various components of the soil fauna for various global biomes and their impact on decomposition and soil processes. An invaluable aid for comparison purposes and highlighting the many deficiencies.

Phillipson, J. (Editor). 1971. Methods of Study in Quantitative Soil Ecology. Blackwell Scientific Publications. IBP Handbook No. 18.